



The Minuteman Repeater Association

# The Minuteman

Volume 36, Number 2

November 2006



## Membership Meeting — Software Defined Radios

**15 November 2006 @ 7 PM [not 7:30!]**

**SOUTH SHORE—Milton Public Library—SOUTH SHORE**

### Dr. Gregory D. Troxel, N1DAM

**Greg is a network researcher at BBN Technologies working on cognitive teams of software radios for the Department of Defense**

Talk in freq: 146.67

More Information on Page 3

## President's Corner ~ Bob Dematia, K1IW

With our second meeting of the year just around the corner, this is the time where the MMRA board starts looking at those members who have not yet renewed. As I am writing this, that number stands at 57. I'm comparing this to the members lost from 2004 and 2005, and it looks quite large. In 2004, we lost 6 members, in 2005 that number was 15. We typically will get another 50% of what we have now, but that still means we'll lose about 30. This is not good.

You've probably heard this before, but it is worth repeating. Almost all of MMRA's operating income comes from dues. This revenue is necessary for paying the electric bills and rent, as well as equipment repair and upgrades. In the past year, MMRA has made some important investments in its infrastructure. The Diamond X-500 antennas at Stoneham (one for VHF, the other for UHF) were replaced after many years of service. We also placed the new Brookline 146.820 machine in service. Though much of the radio equipment for '82 was donated, we still had to purchase the antennas and feedlines as well as the controller. (By the way, yes, this new system is still having problems and is currently off line while we work out the bugs).

**If you have already renewed your membership, thank you very much! If you haven't, please consider doing so as soon as possible.** We make it easy for you by offering an online payment system - simply go to <http://www.mmra.org/access.html> to see your membership status and renew it - or you can still renew the "old-fashioned" way via pony express.

73, Bob - K1IW

### Table of Contents

<i>Next Meeting</i>	1,3
<i>President's Corner</i>	1
<i>MMRA Information</i>	2, 7
<i>October Board Meeting Minutes</i>	4
<i>Repeater Update</i>	5
<i>Proposed Linking System</i>	5
<i>September Meeting Notes</i>	6
<i>TIAOS Report</i>	7
<i>Events @ Fleas</i>	8

## About the Minuteman Repeater Association

The Minuteman Repeater Association (MMRA) is dedicated to Amateur Radio and public service. The MMRA maintains a large system of repeaters in Eastern Massachusetts.

The MMRA meets on the 3rd Wednesday of September, November, January, March, and May. Meeting time, locations and talk-in frequency vary. These are announced in the newsletter and on weekly nets. Meetings are open to all interested parties.

The Minuteman newsletter is mailed one week before each meeting. Members are encouraged to submit articles. Articles may be sent to the editor via email to [newsletter@mmra.org](mailto:newsletter@mmra.org). The deadline for articles is the last Friday of the month preceding the meeting.

Each Tuesday evening at 8PM the MMRA links most of the repeaters for an open net. The topic is "Technical Information and Other Stuff". Please join us.

Membership in the MMRA is open to all radio amateurs. Annual dues are \$25 per individual or \$35 per family. See our website for details.

Email to the club leadership should be sent to [contact@mmra.org](mailto:contact@mmra.org). The MMRA maintains a web site at: <http://www.mmra.org/>

An email distribution list for club members named "MMRA" has been established at: <http://www.yahoogroups.com/>

*No part of this newsletter can be copied or posted elsewhere without prior approval from the club. Your cooperation in this matter is greatly appreciated.*

### Repeater and Frequency Information

Location	MHz	PL	Call	Note
Bolton	29.620	131.8	W1OJ	Affiliated, PTL
Marlboro	53.810	71.9	W1BRI	PTL
Norwell	145.250	77.0	AC1M	Affiliated, PTL
Mendon	146.610	146.2	N1BHI	FTL
Quincy	146.670	146.2	W1BRI	PTL—problem linking
Stoneham	146.715	146.2	N1NVL	PTL—problem hearing
Weston	146.790	146.2	N1BE	PTL
Brookline	146.820	146.2	K5TEC	FTL
Brookline	146.985	88.5	W1FCC	Affiliated, PTL
Marlboro	147.270	146.2	W1MRA	PTL (to 10 Meters)
Hopkinton	223.940	103.5	N1BHI	FTL
Quincy	224.400	103.5	N1KUG	FTL
Weston	224.700	103.5	N1NOM	FTL
Marlboro	224.880	103.5	W1MRA	FTL (to 10 Meters)
Weston	442.700	88.5	N1NOM	(coming soon)
Norwell	443.600	88.5	NS1N	Affiliated, PTL
Stoneham	446.725	88.5	W1DYJ	FTL
Milford	446.825	100.0	WA1QGU	Affiliated, PTL
Brookline	447.875	136.5	K1IW	Affiliated, FTL
Shrewsbury	449.575	88.5	W1BRI	FTL
Marlboro	449.925	88.5	W1MRA	Network Hub

Marlboro	144.390	none	W1MRA	APRS Digipeater
???	145.630	146.2	W1MRA	Fox Box

Internet	Echolink node 94940			
	IRLP node 4133			

**Notes:** FTL = Full Time Linked (usually to the hub)  
 PTL = Part Time Linked (on schedule or demand)  
 Most repeaters link to the MMRA hub, several can link to an alternate destination

**PL:** PL is required to prevent interference. The code **750** will temporarily disable the MMRA PL.

**Autopatch:** Only the hub had a telephone line. Link to the hub if necessary, then bring up the autopatch using the 449.925 autopatch codes

**Control codes are sent to members upon receipt of dues.**

**TIME TO RENEW YOUR  
MEMBERSHIP, IF YOU HAVEN'T**

# Membership Meeting — Software Defined Radios

**15 November 2006 @ 7 PM [not 7:30!]**

**Milton Public Library ~ 476 Canton Avenue Milton, Massachusetts  
SOUTH SHORE**

**Dr. Gregory D. Troxel, N1DAM**

**Greg is a network researcher at BBN Technologies working on cognitive teams of software radios for the Department of Defense**

Greg will give an overview of software-defined radios, a new technology that is already changing Ham Radio. He will talk about a free software radio package called GNU Radio. Greg will also describe a hardware front end for software radios—the USRP—that uses daughter-boards for various functions, from VHF and UHF receivers, to boards for IF use, and to transceivers for 440, 902, 1296 and 2400 MHz. Greg's talk will highlight the challenges in changing GNU Radio from receiving continuous signals to packet radio. Following the talk, Greg will demonstrate GNU Radio and the USRP with several daughter-boards. ***Come and hear about the future of Ham Radio!***

## References:

- A free software radio package: <http://gnuradio.utah.edu/trac>
- The USRP (Universal Software Radio Peripheral): <http://www.ettus.com/>
- Paper by Greg, et.al." Adaptive Dynamic Radio Open-source Intelligent Team (ADROIT): Cognitively-controlled Collaboration among SDR Nodes":  
<http://www.ir.bbn.com/documents/articles/ieee-ntsd-troxel-adroit.pdf>

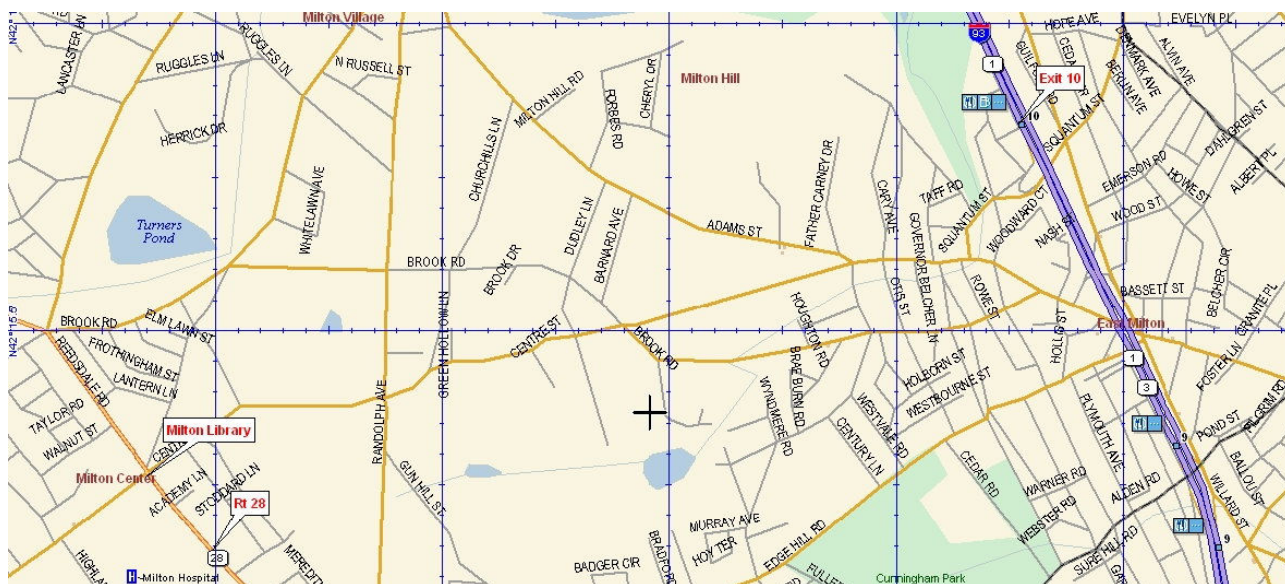
## Directions to the MMRA Meeting

### From West or South:

Take Route 93 (128) to route 28, Randolph Ave.;  
Go north towards Milton on 28.  
At second traffic light turn left on Reedsdale Road (staying on 28N).  
(There is a Tedeschi's on the right and a church on the far left.)  
Library is on left at next traffic light, Canton Ave.

### From Boston, via Southeast Expressway (Route 93 South)

Take Exit 10: Milton, Squantum Street  
Bear right onto Adams Street at fork.  
At second light go left onto Centre Street  
Continue to third traffic light, just after Milton Academy.



For those interested in dinner before the meeting, coordinate on 146.67.

## October Board Meeting

**Bob Evans, N1BE ~ Clerk**

The MMRA Board met at 7:00 PM in the Westborough Library on 18 October. Present were K1IW, K1KWP, N1BDA, N1NVK, W1WH, K1VEA and N1BE. The following summarizes the discussion.

Kevin, K1KWP gave the Treasurer's report, summarizing MMRA's finances. We looked at final numbers for the past fiscal year ending on August 31st and a projection of our funds through the current MMRA fiscal year. We had many two-year renewals at Boxboro, motivated by the free raffle tickets for anyone who renewed for more than one year. The financial projection splits the multi-year renewals between this year and the other years for which renewal was paid. Planned expenses for the current year exceed income received thus far by about \$140. We hope to make this up with renewals that are outstanding, from about 55 MMRA members have not yet renewed. This report was accepted by a unanimous vote.

Bob, K1IW, presented a proposal for more flexible and easier to use repeater linking. This is a follow-up of his action item from the June 2006 board meeting. The primary change is that in addition to the MMRA hub in Marlboro, the 442.7 MHz repeater in Weston would be capable of acting as a hub. All sites except for Echolink and W1OJ's 10 Meter repeater would be capable of linking to either of the hubs, and Weston would still be capable of linking to Marlboro. Benefits of this include more reliability by having an alternate hub. Linking would be more flexible since it is possible to separate MMRA sites into two arbitrary sets of linked repeaters. User codes would change to simpler codes that would no longer require an access code prefix. This proposal included new diagrams of the MMRA repeater system (see next page) with affiliated repeaters, new lists of user and control operator codes, and an itemized list of equipment changes necessary to implement this new scheme. With K1IW abstaining, the board voted to purchase a radio and necessary crystals to implement this plan with the expenditure not to exceed \$300.

Kevin, K1KWP, led a discussion exploring reclassifying the MMRA as a 501(c)(3) Tax-Exempt Organization. Currently, we are classified as 501(c)(7). The primary motivation for this change is that dues and gifts to the MMRA would become tax-deductible and this would improve the possibility to receive grants for improvement to the repeater system. The cost to make this change is perhaps 80 hours work to fill in forms and bylaw changes including a succession policy if all board members could not serve and a conflict of interest policy. Additional on-going work would include recording all board votes by each member and filing annual tax returns. We are watching as FEMARA goes through a similar reclassification process. Kevin offered to begin organizing the information needed for the application even though we have not decided to make this change.

In their MMRA member info, W1WH, N1AP, and W1JMC expressed interest in grant application writing. The board requested that they talk with the MA State RACES Radio Officer, N1CPE, about whom to contact for MEMA funding of emergency communications infrastructure improvements. We envision improvements to linking, and adding battery backup power to our sites as the kind of things that would be of value to MEMA.

We discussed the cost and extra effort required to produce paper newsletters. Notably, many other clubs either no longer produce paper newsletters, or they require a larger dues payment for printing and postage. No action was taken on this issue.

We received notification that Bill, WA1NLR, has resigned his post of MMRA Director. **The MMRA Board wants to acknowledge a great debt and thank Bill for his numerous contributions to the club over many years.** We plan to refill this director seat at the May annual meeting. Given the vacancy, we request nominations for this board seat.

The meeting adjourned at 8:30 PM.



## Repeater Update ~ Bob Dematia, K1IW

The MMRA system has a number of issues right now: As some members have noticed, the new 146.820 repeater in Brookline has been taken off the air. Ongoing problems with intermod has forced us to remove this repeater from service and bring it back to the shop for additional work. As part of this refurbishment, the system will be getting a new link radio and will have the various cavities and filters in the transmission system retuned and/or replaced. To increase accessibility, the '82 machine will soon be placed back in service at the old Marlborough East site. We will give it a good work out here before putting it back in Brookline.

The 146.715 repeater in Stoneham appears to be having receiver problems. It is certainly out-transmitting what it can hear. This is going to need to be looked at soon.

The link radio for 146.670 has been intermittent - although the transmitter works, meaning we can hear conversations from '67 on the HUB, the receiver sometimes stops - meaning people on '67 cannot hear the HUB. Bryan suspects the cause of this to be the radio getting too warm. It is physically located near the 222 power amp. A few months ago, the fan on this power amp failed and

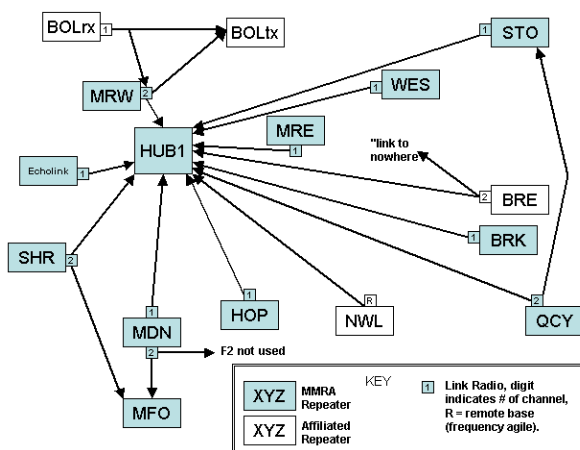
thus the link receiver gets cooked.

On a more positive note, progress is still being made on getting the 442.700 repeater in Weston online. Once it is on the air, it will serve as a second HUB for the MMRA system. Over time, each repeater in the MMRA network will be outfitted with a 2-channel link radio, capable of operating into either the 449.925 HUB or the new 442.700 HUB. This will provide us with more flexibility as to how the repeaters are configured, and will also give us some redundancy for when one of the two HUBs fails. The before and after diagrams of the MMRA network are shown below.

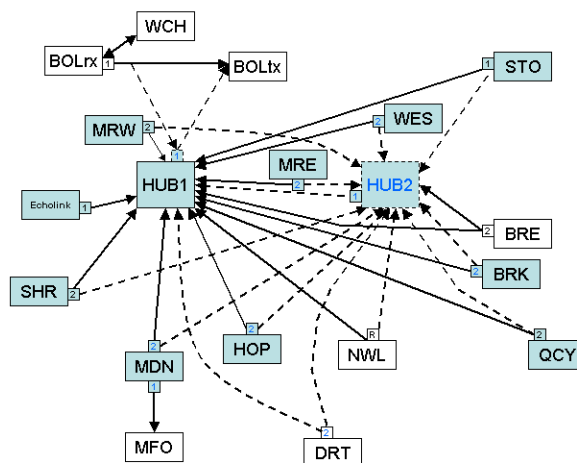
Roger, W1OJ, owner/operator of the 29.62 10m repeater to which MMRA '27 links, will be making some changes to his system soon. He is rebuilding the 448.625 UHF repeater located on Mt. Wachusett, and this repeater will be full-time linked to 29.62. MMRA will begin linking to 10M through our 449.925 HUB, rather than 147.27. This will allow us to link different 2m repeaters rather than having to use '27. The MMRA board is seeking your opinion on the best default state for the network - so let us know what you think.

## Proposed New Linking System

### Current Configuration



### Proposed Configuration



## MMRA September Meeting

Larry Banks, W1DYJ



**Steve, N1BDA, running the meeting.**

Twenty two MMRA members and guests attended our September meeting to hear Gordon Pettengill, W1OUN, talk about the early days of Moonbounce. The photos and slides below are of or by Gordon. Our many thanks go out to W1OUN!

Before Gordon's talk, VP Steve Telsey, N1BDA, ran the business meeting. Discussions included a repeater update; the need for a net control for the 1st Tuesday; Roger, WA1NVC's 10M Project; and Treasurer Kevin's report that for the fiscal year we have about \$500 in uncommitted funds.

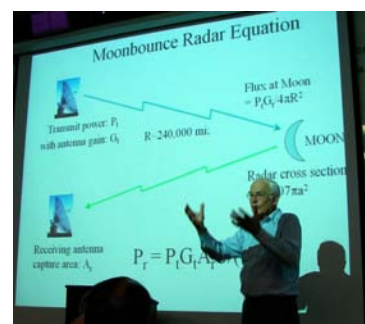


**How many Hams does it take to make one laptop work?**



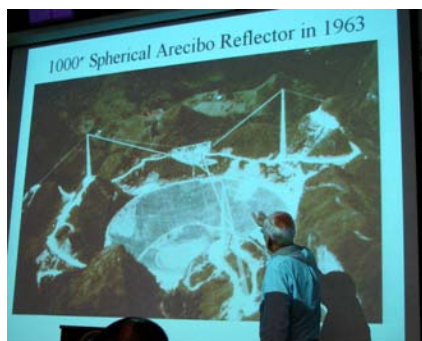
What does it take to do moonbounce at 2 mtrs?

- Assume: Transmitted power of 700 watts;  
Receiver system + sky noise of 150K;  
Receiving bandwidth of 100 Hz;  
Post-detection integration of 1 sec;
- Putting in numbers says for a reliable detection (5 std devns above noise background), we need  $G_t G_r = 2000$ , or a pair of beams each having a gain of ~16 dBi – approximately what a 32-element broadside array provides.



### The 1000-ft Arecibo Antenna

- About this time, in June 1960, I first visited the site of the future 1000-ft Arecibo Ionospheric Observatory in Puerto Rico. It was a tobacco farm, located in a natural cavity formed by eroded limestone (geologically called "Kurst").



### The Heart of the Arecibo Radar System

- Upper: Receiver Room, showing master clock and frequency standards.
- Lower: The controls for the 430-Mhz klystron transmitter: 2.5 Mw peak, 150 kw average.

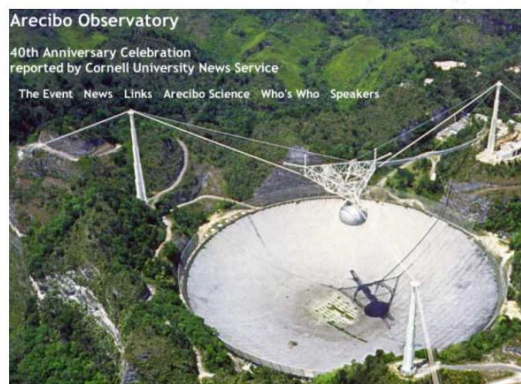


### The Gregorian Feed System

- The secondary and tertiary reflectors are housed in a silvered radome that shields them from "seeing" direct interference from the horizon.
- The flexibility of having two reflecting surfaces permits control of the illumination or "taper" of the big primary reflector, allowing an aperture efficiency of almost 90%.



### The Arecibo Observatory Today



## MMRA Leaders

President	Bob DeMattia	K1IW
Vice President	Steve Telsey	N1BDA
Secretary	John McGovern	W1JMC
Treasurer	Kevin Paetzold	K1KWP
Clerk	Bob Evans	N1BE
Technical Officer	Bryan Cerqua	W1BRI
Director 2006-08	Clark Conti	N1NVK
Director 2006-08	Bill Hanrahan	W1WH
Director 2005-07	Steve Schwarm	W3EVE
Director 2005-07	Open	
Emergency Coordinator	James Cahill	KB1LOY
Net Manager	Larry Banks	W1DYJ
Newsletter Editor	Larry Banks	W1DYJ
Public Service Coordinator	James Cahill	KB1LOY
VEC Liaison	Bill Wade	K1IJ
Web Page Editor	Bob DeMattia	K1IW

### Newsletter Delivery

If you received this via US Mail, you might want to think about having it sent by eMail. You will receive it earlier, it will be in color, it may have MORE great content, and it will save the MMRA \$\$\$! Send your request to [W1JMC@mmra.org](mailto:W1JMC@mmra.org).

## TIME TO RENEW YOUR MEMBERSHIP, IF YOU HAVEN'T

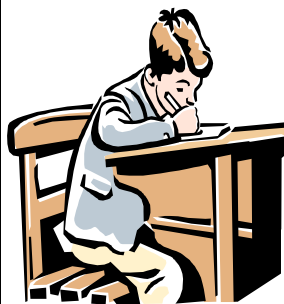
**Don't Forget!**  
**Tuesday's @ 8 PM**  
**Technical, Informational**  
**and Other Stuff Net**  
**Larry Banks, W1DYJ**

Most of the MMRA's repeaters are linked every Tuesday night for the MMRA TIAOS Net. Join us! Over the past two months we averaged seven participants with a high of ten. This is a good way to keep up with what is happening with the MMRA as well as ask your ham related questions.

We are looking for a net control operator for the first Tuesday of each month – contact me at [W1DYJ@mmra.org](mailto:W1DYJ@mmra.org) if you would like to try your hand at running a net some evening – we have a script that you can use to start with. This is good practice for a number of ham related operations, from emergency preparedness to contesting.

### Current Net Control Operators:

Week 1 ?????	<b>We Need You!</b>
Week 2 W1EUJ	Dave Goncalves
Week 3 KB1KZI	Jimmy Devarie
Week 4 K1KWP	Kevin Paetzold
Week 5 W1DYJ	Larry Banks
(also substitute & Net Manager)	



### MMRA VE Sessions

3rd Saturday of each Month  
 9 AM at the Marlboro Public Library  
**Contact: Bill Wade, K1IJ**  
 781-891-9079 Evenings 6 to 10 PM,  
 Weekends 8 AM to 10 PM.  
**Accredited by the ARRL VEC**

# **Membership Meeting — Software Defined Radios**

**15 November 2006 @ 7 PM ~ Milton Public Library—SOUTH SHORE**

## **Dr. Gregory D. Troxel, N1DAM**

**Greg is a network researcher at BBN Technologies working on cognitive teams of software radios for the Department of Defense.** **More Information on Page 3**

## **Calendar of Ham Radio Events**

### **Public Service Events**

See this web site for contact information

<http://purl.org/hamradio/publicservice/nediv>

None listed after 12 November 2006

### **New England Area Ham - Electronic Flea Markets**

See this web site for contact information

<http://mit.edu/w1gsl/Public/ne-fleas>

17 Feb	Marlborough MA AARC
24 Feb	Milton VT RANV
17 Mar	Pomfret CT ECARA
15 April	Cambridge MA FLEA at MIT [Third Sunday April thru October]
22 April	Enfield CT NEWS East VHF UHF Conf
28-29 April	Watertown MA Photographica
14 July	Union ME PBARC
7 Oct	Wallingford CT Nutmeg Conv
27 Oct	Waterford CT TCARC Auction

THE MINUTEMAN REPEATER ASSOCIATION

**MMRA**  
**P.O. Box 669**  
**Stow, MA. 01775-0669**

Email: [contact@mmra.org](mailto:contact@mmra.org)



**TIME TO  
RENEW YOUR  
MEMBERSHIP,  
IF YOU HAVEN'T**

---

**WE'RE ON THE WEB!**  
**HTTP://WWW.MMRA.ORG/**

---